

REMOTE TRACE GAS DETECTION AND ANALYSIS

ABSTRACT OF THE DISCLOSURE

A system for detecting and analyzing chemical and biological aerosols. A beam of radiation is used to radiate a target cloud including the aerosol. The radiation energy that is absorbed by the cloud is thermalized by collisional energy transfer between the molecules that absorb the radiation to generate heat. The wavelength of the electromagnetic radiation is selected to be in resonance with the absorption lines of water or oxygen molecules in the cloud, or to be in resonance with absorption lines of known target molecules in the cloud to generate the heat. An increase in the cloud temperature increases the emission intensity of the molecules against the background, resulting in improved detection of the target molecules in the aerosol. A tracking telescope collects the thermal emissions generated by the radiation beam. A spectrometer receives the emissions from the cloud and generates an emission spectrum.